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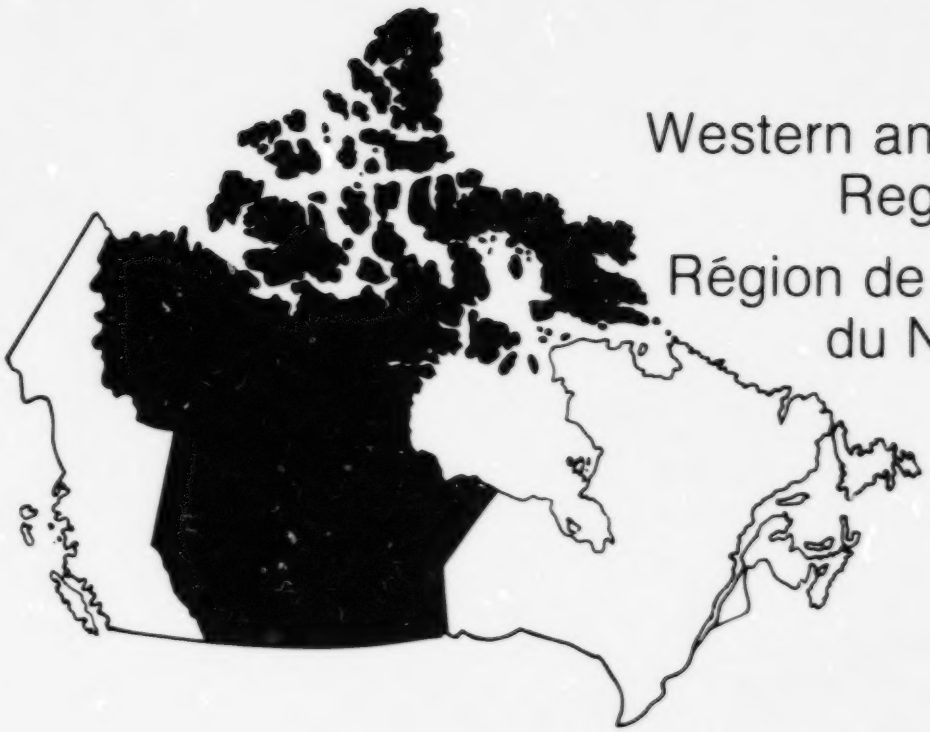

Western and Northern Region

Région de l'Ouest et du Nord

Environmental Protection Service

Service de la protection de l'environnement

PETROLEUM PRODUCT STORAGE AND HANDLING SURVEY AT FEDERAL FACILITIES - MANITOBA INTERLAKE

by

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PETROLEUM PRODUCT STORAGE AND HANDLING SURVEY AT FEDERAL FACILITIES IN THE MANITOBA INTERLAKE

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ABSTRACT

A survey of federal facilities in the Manitoba Interlake region was conducted to assess compliance with Manitoba Regulation 156/80, respecting the storage and handling of petroleum products. Inventory data were compiled and compared with the requirements of the regulation. The owners and operators of the storage tank systems were verbally apprised of deficiencies and proper procedures for carrying out an inventory reconciliation program. Compliance with the regulation was difficult to assess in a number of cases because of a lack of information on storage tank systems. Most installations, however, were found to be out of compliance with the provincial requirements.

RESUME

Une étude des installations fédérales dans la region entre les lacs du Manitoba a été prélevée pour évaluer la conformité avec le Règlement 156/80 du Manitoba, concernant l'emmagasinage et la manutention des produits pétroliers. Les données d'inventaire ont été compilées et comparées avec les exigences du Règlement. Les propriétaires et opérateurs des systèmes de réservoirs pétroliers ont été avisés de vive voix des insuffisances et démarches à suivre pour établir un programme de réconciliation d'inventaire. La conformité avec le Règlement était difficile à évaluer dû au manque de renseignements concernant les systèmes d'emmagasinage. La plupart des installations, cependant, n'étaient pas conformes avec les exigences provinciales.

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PETROLEUM PRODUCT STORAGE AND HANDLING SURVEY AT FEDERAL FACILITIES IN THE MANITOBA INTERLAKE

1.0 INTRODUCTION

The management and control of petroleum product storage tanks has been an issue in Manitoba since the early 1970s. At that time, a number of serious groundwater contamination problems occurred because of leaking underground and above-ground storage tanks in locations such as Birds Hill and Stonewall. As a result of these problems and others, Manitoba introduced regulations in 1976 covering the storage and handling of petroleum products. Subsequent revisions to the regulations were made in 1977 and again in 1980, resulting in the promulgation of Manitoba Regulation 156/80. This regulation, titled the Gasoline and Associated Products Storage and Handling Regulation, is currently in effect, although revisions are under consideration, and are expected to come into effect in 1987.

Following the introduction of Manitoba Regulation 156/80, the Manitoba District Office of Environmental Protection, Environment Canada, informed all federal departments and agencies of the requirements under the provincial regulation. As no federal standards for the storage and handling of petroleum

products had been developed by Environment Canada, federal departments and agencies were advised that they must meet the provincial standards, under provisions of the Canada-Manitoba Accord for the Protection and Enhancement of Environmental Quality.

In May 1985, Manitoba Environment and Workplace Safety and Health requested the assistance of Environmental Protection to ensure that all federal installations in the Interlake region in particular were in compliance with Manitoba Regulation 156/80. This area has experienced a number of problems with leaking storage tank systems and the subsequent contamination of aquifers with petroleum products.

2.0 STUDY OBJECTIVES

In 1985, a program was undertaken by Environmental Protection, Manitoba District Office, to address Manitoba's concerns with potential leaking tank systems in the Interlake area. The specific objectives were to:

1) update inventory data on all federal facilities in the Interlake area

2) determine the compliance status of the facilities with the provincial regulation and ensure that any deficiencies were addressed, and

3) develop a strategy for assessment of storage tank systems at federal facilities on a province-wide basis.

3.0 INTERLAKE AREA

The Interlake area is bounded approximately by Winnipeg on the south, Lake Winnipeg on the east, Lake Manitoba on the west, and Gypsumville on the north, and comprises an area of approximately 19,000 square kilometers (Figure 1). The region is characterized by extensive areas of gravelly and sandy soils of high permeability, underlain by fractured limestone bedrock, although parts of the region also consist of clay soils of low permeability. Groundwater is used extensively as a drinking water source. The area is considered to be sensitive to groundwater contamination because of soil type and historical problems with leaking storage tanks, and Manitoba recently announced its intention to formally declare the area as "sensitive" under the provisions of the proposed revisions to Manitoba Regulation 156/80.

4.0 MANITOBA REGULATION 156/80

The Manitoba regulation dealing with petroleum product storage and handling (Appendix A) is considered to be one of the more progressive in Canada in terms of environmental protection (Tingley, 1985). It covers the design, installation and operation of storage tank systems in the province except: a) aboveground tanks of less than 4545 litres (1000 IG) capacity, which are connected to a heating appliance, and b) overhead tanks less than 4545 litres capacity. These provisions are intended to ex-

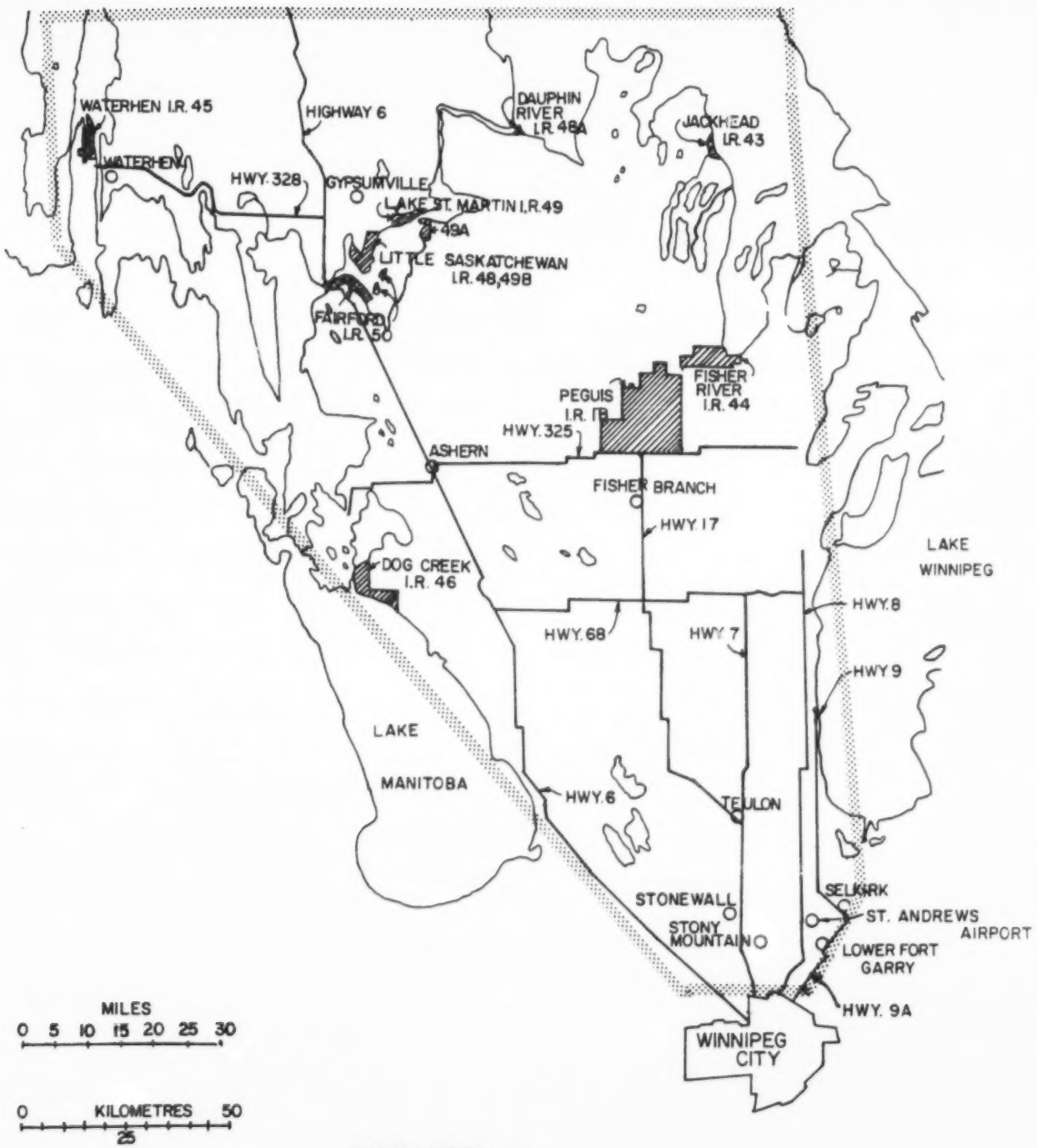

FIGURE 1
MANITOBA INTERLAKE
STUDY AREA

empt small tanks used for purposes such as home heating, fuelling private vehicles and similar applications.

While considerable overlap exists between Manitoba Regulation 156/80 and other precursory standards such as the National Fire Code and parallel provincial legislation, the regulation was developed to address matters related to environmental protection not covered by these other standards. The main provisions of Manitoba Regulation 156/80 are as follows:

1) All storage tank systems must be registered with Manitoba Environment prior to installation or operation.

2) Tanks and piping must be installed and tested according to specific standards.

3) With certain exceptions, inventory records must be maintained and reconciled on each day of operation, or, at a minimum, weekly.

4) Product spills, suspected leaks, and inventory shortages over a certain amount must be reported.

5) Abandoned tanks must be taken out of service.

6) Storage tank systems must be upgraded in areas designated as sensitive or critical by the Minister.

The proposed amendments to the regulation will allow for tightening of certain provisions, but will not amount to a wholesale revision. For example, above-ground tanks of any size will have to be diked if they are within a certain distance of a

surface water body and the drainage pattern is towards that water body. Provisions that will allow Manitoba to certify petroleum contractors for tank installations are also planned. Installation and monitoring standards will be tightened to reflect new technology and changing environmental concerns. The amendments will also facilitate the Ministerial declaration of sensitive and critical areas.

5.0 METHODS

An initial inventory form was developed by the Manitoba District Office of Environmental Protection to compile data on the various federal facilities. The inventory form was based on previous experience in inspecting petroleum storage facilities, and on the requirements of the Manitoba regulations. Letters were sent to several departments and agencies which were known or thought to have fuel storage facilities. Telephone solicitations, where required, were also made to obtain information on fuel storage sites.

Over the period of November 1985 to July 1986, inspections were carried out at all facilities identified as having petroleum storage tanks. The inventory forms were completed on site, and the operator of the tank system was verbally advised of deficiencies. Each operator was also instructed on the proper methods of doing inventory reconciliation. Inventory reconcilia-

tion booklets developed by Manitoba Environment were distributed for this purpose. An example of the inventory reconciliation forms is contained in Appendix B.

On the basis of some initial inspections, the inventory form was revised and improved to facilitate data collection (Appendix C).

Follow-up inspections were carried out at several facilities where inventory reconciliation had been initiated subsequent to the first inspection. Progress was assessed and any continuing problem areas were discussed with the operators of the storage tank systems.

6.0 RESULTS AND DISCUSSION

Twenty-two facilities were inspected, as shown in Table 1, and data were subsequently gathered and compiled for the 18 facilities and locations that had petroleum product storage tanks. Several of the 18 facilities surveyed had more than one site with storage tanks. In total, 39 underground tanks, and 13 above-ground tanks were inventoried.

The owners and operators of the storage tank systems were identified during the inspections, and, as shown in Table 2, a

TABLE 1

PETROLEUM PRODUCT STORAGE TANKS AT FEDERAL FACILITIES IN MANITOBA INTERLAKE AREA

	NO. OF TANKS	
	ABOVE GROUND*	UNDERGROUND
TRANSPORT CANADA		
- St. Andrews Airport	0	3
- Selkirk Coast Guard Base	0	0
PUBLIC WORKS CANADA		
- Selkirk Shipyards	2	0
- St. Andrews Locks	0	0
SOLICITOR - GENERAL CANADA		
- Stony Mountain Institution	3	3
ENVIRONMENT CANADA		
- Lower Fort Garry	0	0
INDIAN RESERVES		
- Dauphin River	0	1
- Fairford	0	1
- Fisher River	0	6
- Jackhead	0	1
- Lake Manitoba	0	3
- Lake St. Martin	0	3
- Little Saskatchewan	0	0
- Peguis	6	4
- Waterhen	1	3**
CANADIAN BROADCASTING CORPORATION		
- Fisher Branch Repeater Stn.	0	1
- Jackhead Repeater Stn.	0	1
- St. Martin Repeater Stn.	1	0
OTHER (St. Andrews Airport)		
- Winnipeg Aviation	0	2
- Winnipeg Flying Club	0	2
- Vega Helicopters	0	3
- Central Canada Flight Training	0	2
TOTAL	**13**	**39**

* Excluding tanks less than 4545 L(1000 IG) capacity
** Includes 2 Band-owned tanks located off the Reserve

TABLE 2

TANK OWNERSHIP AND OPERATION AT FEDERAL FACILITIES IN MANITOBA INTERLAKE AREA

OPERATOR / OWNER	FED. DEPT.	FED. AGENCY/ CROWN CORP.	CNR/CPR	IND. BAND	OIL CO.	PRIV.	OTHER
FED. DEPT.	11	-	-	-	-	-	-
FED. AGENCY/ CROWN CORP.	-	3	-	-	-	-	-
CNR/CPR	-	-	-	-	-	-	-
INDIAN BAND	-	-	-	9	-	2	-
OIL CO.	-	-	-	-	-	-	2
PRIVATE	-	-	-	-	-	24	-
OTHER	-	-	-	-	-	-	-
TOTAL	**11**	**3**	**0**	**9**	**0**	**26**	**2**

number of different situations were encountered. Many of the tanks (24) were owned and operated by a private business, such as a small retail store. This figure includes tankage owned and operated by individual Band members on Reserves. Indian Bands owned and operated nine tank systems on Reserves, while two tank systems were Band-owned but located off the Reserve.

Federal departments owned and operated 11 tanks, used primarily for fuelling government vehicles, or storing heating fuel. One Crown Corporation (CBC) had three tanks used for stand-by diesel electric generators.

Only two tanks were found to be owned by an oil company, and these were located at and operated by a non-profit flying club at St. Andrews Airport.

Pertinent data collected during the on-site inspections were summarized (Table 3) and the compliance status was assessed for the facilities. This assessment proved to be difficult in many cases because of a lack of information. As shown in Table 3, many owners and operators did not know installation dates, who installed the tanks, the type of testing done (if any), or specific tank construction details.

The most significant area of non-compliance with Manitoba

TABLE 3

SUMMARY OF DATA COLLECTED AT FEDERAL FACILITIES IN MANITOBA INTERLAKE AREA

PARAMETER	NO. OF TANKS UNDERGROUND	ABOVE GROUND	TOTAL
TANK CAPACITY (L)			
<4545 (<1000 IG)	1	N/A	1
4545-13638 (1000-3000 IG)	22	2	24
13639-22730 (3001-5000 IG)	11	6	17
22731-45450 (5001-10000 IG)	2	4	6
>45450 (>10000 IG)	1	1	2
Unknown	2	0	2
TANK CONSTRUCTION			
Steel*	15	12	27
Coated Steel	12	1	13
w/Sacrificial Anode	6	0	6
w/Impressed Current	2	0	2
Fiberglass	2	0	2
Unknown	2	0	2
TANK AGE			
<3 yr	3	1	4
3-7 yr	13	6	19
8-15 yr	13	0	13
>15 yr	4	2	6
Unknown	6	4	10
PRODUCT			
Gasoline	18	4	22
Gasohol	0	0	0
Diesel Fuel	3	5	8
Heating Oil	9	4	13
Aviation Gas	8	0	8
Jet Fuel	1	0	1
Waste Oil	0	0	0
PUMPING/DISTRIB. SYSTEM			
Suction	39	10	49
Submersible	0	0	0
Gravity	0	3	3
Unknown	0	0	0
INSTALLER			
Petroleum Contractor	10	6	16
General Contractor	10	1	11
DPW (via Contractor)	0	5	5
Self	1	0	1
Unknown	18	1	19

TABLE 3 (CONT'D)

LEAK TESTING			
Air Pressure	2	0	2
Hydrostatic	9	0	9
Not Done	2	6	8
Not Required	13	6	19
Unknown	13	1	14
INVENTORY RECONCILIATION			
Complete	9	0	9
Not Done	11	8	19
Not Required	19	5	24
DIKING			
Satisfactory	N/A	9	9
Not Satisfactory	N/A	4	4
SOIL PERMEABILITY**			
High	3	0	3
Medium	3	0	3
Low	6	1	7
Unknown	27	12	39
DISTANCE TO DRINKING WATER SUPPLY			
<20 m	5	0	5
20-200 m	15	7	22
>200 m	10	5	15
Unknown	9	1	10
DISTANCE TO SURFACE WATER			
<20 m	0	0	0
20-200 m	6	3	9
>200 m	33	9	42
Unknown	0	1	1
DISTANCE TO WATER TABLE			
<3 m	0	0	0
3-10 m	0	0	0
>10 m	0	0	0
Unknown	39	13	52

N/A Not Applicable
* Includes steel tanks where type of tank protection, if any, is unknown
** Based on recollection of owner/operator

Regulation 156/80 involved inventory reconciliation. During initial inspections, only one of the facilities (with two underground tanks) was found to be keeping proper inventory records (Table 4), including a reconciliation of physical inventory against sales and deliveries. Follow-up inspections revealed that others had started to maintain a proper inventory, while some had not, citing various reasons, such as lack of time, or lack of understanding of the procedure. One of the private tank owners who started inventory reconciliation after our initial inspection stated that, within the first week, he discovered that one of his employees had been stealing some of the money from gasoline sales. The dishonest employee was subsequently dismissed. Inventory reconciliation was not required for a number of tank systems connected to heating appliances, such as furnaces or boilers, since product withdrawal is not metered in these applications.

Diking was not present, as required, around 10 tanks initially inspected, although a new dike around six bulk storage tanks was being constructed at one site during a follow-up inspection.

Other areas of non-compliance were difficult to assess. It appeared that leak testing had likely not been properly done on a majority of the tanks installed since 1976, although this was a requirement for all new installations since that date. Specific

TABLE 4

AREAS OF NON-COMPLIANCE FOR FEDERAL FACILITIES IN THE MANITOBA INTERLAKE AREA

REQUIREMENT	% OF TANKS NOT IN COMPLIANCE*	
	UNDERGROUND	ABOVE GROUND
INVENTORY RECONCILIATION	67	69
LEAK TESTING	65**	46
CORROSION PROTECTION	***	N/A
DIKING	N/A	31

* As of December 1986
** Includes tanks where info. unknown
*** Unable to determine because of insufficient data
N/A Not Applicable

tank construction details, such the type of coating or corrosion protection were also unknown for many sites (Table 3).

In conducting this program, a number of problems were identified in collecting information and addressing deficiencies that were found. These included:

1) lack of on-site construction and installation details including plans of the tank system.

2) lack of knowledge of the tank system by the operator.

3) reluctance by some operators to maintain the required inventory records.

4) lack of direct regulatory control over facilities, since regulations are provincial.

The question of regulatory control was discussed with provincial officials, and, subsequently, a list of possible scenarios regarding tank ownership and operation was developed. This list was then used to assign the lead enforcement/compliance role to the appropriate agency (Environmental Protection or Manitoba Environment), according to which agency was thought to be in best position to deal with deficiencies noted at facilities on federal land. The list of responsibilities, as shown in Table 5, essentially assigns lead role to Environmental Protection for all federal departments, agencies, and Indian Bands or Band members that own tank systems on federal land, while facilities owned by private businesses, oil companies and provincial

TABLE 5

PETROLEUM PRODUCT STORAGE AND HANDLING IN MANITOBA
DIVISION OF RESPONSIBILITIES

LOCATION:	FED. CROWN LAND/I.R.	PROV. CROWN LAND	PRIVATE LAND
TANK OWNER		**LEAD AGENCY**	
FEDERAL DEPT/ CROWN CORP.	EP	EP/PROV*	EP/PROV*
INDIAN BANDS/ INDIVID. BAND MBRS.	EP	PROV	PROV
CPR - RAIL	EP	EP/PROV*	EP/PROV*
- TRUCKING	EP	PROV	PROV
PRIVATE INDIVID/ COMPANIES	PROV/EP**	PROV	PROV
PROV. DEPT/ CROWN CORP.	PROV/EP**	PROV	PROV

* EP will have lead role for inspections, response to problems etc., but Prov. will provide support and possible legal action

** Prov. will have lead role as above, but EP will provide support by way of inspections, advice, etc. when on-site

agencies such as Manitoba Hydro or Manitoba Telephone System, but located on federal land, would be dealt with by Manitoba Environment. Of tne Interlake sites inspected, the four private facilities located at St. Andrews Airport (Table 1) were assigned to provincial lead role.

7.0 CONCLUSIONS

A survey of federal facilities in the Manitoba Interlake region revealed that most facilities were not in compliance with Manitoba Regulation 156/80. The main area of non-compliance involved lack of proper inventory reconciliation. Diking of above-ground tanks was also not acceptable in a number of cases, and leak testing of many systems did not appear to have been carried out. Compliance with the regulations was difficult to assess in a number of cases because of a lack of information on design, construction and installation of the tank systems.

Most owners and operators of the tank systems were receptive to the idea of doing inventory reconciliation, when the economic and environmental benefits of doing so were explained to them. It was concluded, however, that periodic checking of inventory records would be required to ensure that reconciliation was being properly done.

The main reason for non-compliance with the regulations was

a lack of awareness of the requirements, even though most, if not all departments and agencies had been advised of the provincial requirements several years ago.

8.0 RECOMMENDED APPROACH - ENVIRONMENTAL PROTECTION

8.1 INTERLAKE AREA

In order to ensure continuing compliance with Manitoba Regulation 156/80 for federal facilities located in the Interlake area, the following approach is recommended for the Manitoba District Office of Environmental Protection:

1) Send letters outlining the deficiencies noted during inspections to the owners of the tank systems, with copies to the operators as appropriate. Specify deadlines for completion of remedial action and requirement for written notification to Environmental Protection following completion of required action.

2) Carry out inspections to verify compliance with the required remedial action, including verification of inventory reconciliation records.

3) Apprise owners of tank systems of changes in the Manitoba regulatory requirements as these changes become available. (Ministerial designation of sensitive and critical areas in the province is expected to entail additional monitoring and

upgrading or replacing of tank systems by tank owners located in these areas.)

4) Subject to the provisions of the amendments to Manitoba Regulation 156/80, review inventory data on tank systems considered to be deficient because of faulty design or installation, and ensure that owners of these tank systems take additional action as follows:

a) Prior to June 30, 1988, test tanks and piping systems older than 15 years or those deemed to have been improperly installed, using a recognized tank testing method, and submit test results to Environmental Protection for review.

b) Submit inventory reconciliation records for tanks older than 15 years, that are tested and found to be tight, to Environmental Protection for periodic review, as requested.

c) Immediately remove from service tanks that are tested and found to be leaking.

d) Test underground heating oil tanks, or others where inventory reconciliation is not possible, once a year by recording dip readings every day over a two week period, and noting any discrepancies or shortages in readings, and, where requested, submit results to Environmental Protection for review.

8.2 PROVINCE-WIDE STRATEGY

The recommended province-wide approach for dealing with federal facilities owning petroleum product storage systems is as follows:

1) Canvass individual departments and agencies by letter and telephone for an initial listing of facilities with petroleum storage facilities.

2) Carry out on-site inspections of all facilities where information required to complete the inventory form is lacking or ambiguous.

3) Explain inventory reconciliation procedures to the operators of the storage tank systems during the on-site visits.

4) Advise, both at the site and by follow-up letter, the owner and operator of the facility of obvious deficiencies. Specify deadlines for completion of required remedial action and requirement for written notification to Environmental Protection for completion of remedial action.

5) Carry out follow-up inspections at those sites requiring remedial action, and at all other sites on a random basis.

6) Update inventory information every two years, through inspection or liaison with the departments or agencies involved.

7) Ensure that tank systems considered to be deficient, in

the interim period prior to amendments to Manitoba Regulation 156/80, are identified and monitored or upgraded as recommended in Section 8.1.

8) Ensure that designated contacts are established within each department or agency to approve and oversee the installation and operation of its storage tank systems.

9.0 REFERENCES

Tingley, D., "Underground Storage Tanks: A Review of Canadian Legislation", presented at the Canadian Workshop on Leaking Underground Storage Tanks, Vancouver, B.C., November 5-6,1985.

APPENDIX A

MANITOBA REGULATION 156/80

Manitoba Regulation 156/80

Being a Regulation Under The Clean Environment Act Respecting the Storage and Handling of Gasoline and Associated Products

(Filed September 3, 1980)

Definitions

1. In this regulation,

(a) "abandoned" means, when used in reference to a storage tank system, any storage tank system that has been in disuse for the purpose of conveying gasoline or associated products for more than twelve consecutive months;

(b) "above ground tank" means any tank which is located at grade and includes vertical tanks;

(c) "alter" means any enlargement of a storage tank system or any change in the configuration of the piping or tank(s) or the replacement of any tank;

(d) "approved" means approved by the Department in writing;

(e) "associated product" means petroleum or any derivative thereof, except gasoline, which is in a liquid state at ambient temperature and pressure;

(f) "critical area" means any area so designated from time to time by the Minister where groundwater or surface water is contaminated by gasoline or associated product and where such contamination will or may have a harmful or deleterious effect on the user of that water;

(g) "conveying" means the utilization of a storage tank system for the movement of gasoline or associated product;

(h) "department" means the Department of Consumer and Corporate Affairs and Environment;

(i) "empty" means, when used in reference to a storage tank system, void of its contents as far as is practicable by such means as suction, pouring or pumping;

(j) "flash point" means the lowest temperature determined using a Tagliabue closed-up tester, at which vapour of a gasoline or associated product forms a flammable mixture in air;

(k) "gasoline" means a liquid product of petroleum that has a flash point below 37.8°C and is designed primarily for use in an internal combustion engine;

(l) "leakage" means any discharge of gasoline or associated product from a storage tank system or pipeline other than through the usual function for which the storage tank system or pipeline was designed, and "leak" and "leaking" have similar meanings;

(m) "normal" means, when used in reference to an apparent loss of gasoline or associated product from an underground storage tank system, ¼ of 1% of the capacity of the storage tank or ¾ of 1% of the volume of gasoline or associated product conveyed through the storage tank system, whichever is greater; and, when used in reference to an apparent loss of product from an above ground storage tank system, 2½% of the capacity of the storage tank, or 2½% of the volume of gasoline or associated product conveyed through the storage tank system, whichever is greater; or such other lesser percentage as the Minister may from time to time specify;

(n) "operator" means

(i) a person who is responsible for the day-to-day maintenance and operation of a storage tank system; or

(ii) when referring to a vehicle, the driver in charge of the vehicle;

(o) "owner" means, when used in reference to an abandoned storage tank system, that person having the possessary rights to, and care, control or management of and over the storage tank system;

(p) "overhead tank" means any tank which is supported above grade and includes horizontal tanks;

(q) "sensitive area" means any area so designated by the Minister from time to time having regard to, but not limited to, such criteria as the permeability of the soil; the existence and location of groundwater aquifers; the corrosiveness of the soil; bedrock geology; and location of surface water courses;

(r) "spill" means any loss of gasoline or associated product in excess of 68.2 litres (15 gallons) from a storage tank system, pipeline or vehicle onto or into the soil or water, and "spillage" has a similar meaning;

(s) "storage tank system" means a storage tank and all vent, fill and withdrawal piping associated therewith;

(t) "vehicle" means a tank truck, stake truck, trailer, semi-trailer, tractor and other conveyance and appurtenances thereof designed for or capable of transporting gasoline or associated product, other than fuel used in the operation of that vehicle.

General Requirements

2. Any person operating or intending to operate a storage tank system is not required to file a proposal or register as provided for in subsection (1) and (4) of section 14 of The Clean Environment Act.

3. Subject to sections 8, 9 and 11, above ground storage tanks of capacity of less than 4545 litres (1,000 gallons) that are connected to a heating appliance and overhead tanks of capacity of less than 4545 litres (1,000 gallons) are exempt from the provisions of this regulation.

4. No person shall construct or reconstruct or use or permit the use of a storage tank system that does not meet the minimum requirements as prescribed in section 1 of Schedule A.

5. (1) The Minister may designate any area of the Province as critical for the purposes of this regulation.

5. (2) Within 30 days of designation of a critical area, the owner or operator of a storage tank system, in a critical area, shall

(a) have the tests as prescribed in section 3 of Schedule A conducted; and

(b) where such tests show a leakage, comply with section 22 of this regulation; or

(c) where such tests show that the storage tank system is not leaking, upgrade the system, within one year of said designation, in accordance with section 4 of Schedule A; and

(d) in writing, notify the department of the upgrading method employed, within 30 days of the completion of upgrading.

6. (1) The Minister may designate any area of the Province as sensitive for the purposes of this regulation.

6. (2) Upon the designation of a sensitive area and within the dates prescribed by the Minister, the owner or operator of a storage tank system in the sensitive area shall

(a) have the tests as prescribed in section 3 of Schedule A conducted; and

(b) where such tests show a leakage, comply with section 22 of this regulation; or

(c) where such tests show that the storage tank system is not leaking, upgrade the system in accordance with section 4 of Schedule A; and

(d) in writing, notify the department of the upgrading method employed within 30 days of the completion of upgrading.

7. The Minister may vary the requirements of Schedule A when a person affected by this regulation, upon written application to the department, satisfies the Minister that his proposal meets or surpasses the requirements as prescribed in Schedule A.

8. No owner or operator shall directly or indirectly contaminate the soil or water by causing, suffering or permitting leakage of gasoline or associated product from a storage tank system or vehicle.

9. No person shall directly or indirectly contaminate the soil or water by causing, suffering or permitting spillage of gasoline or associated product from a storage tank system or vehicle.

10. No person shall directly or indirectly contaminate any body of water or any underground water supply by causing, suffering or permitting the dumping, depositing, dropping, throwing, discarding or leaving gasoline or associated product.

11. (1) No person shall transfer gasoline or associated product from a storage tank system to a vehicle or from a vehicle to a storage tank system without supervising the transfer at all times in such a manner as to be able to immediately shut off the flow of gasoline or associated product during the transfer of products.

11. (2) No person shall directly or indirectly cause or permit the overflow of gasoline or associated product from a storage tank system.

12. Notwithstanding section 9, the use of associated products is acceptable for

(a) application to road surfaces by provincial government departments and agencies, municipal corporations or authorized agents of provincial government departments and agencies and municipal corporations within departmental guidelines or regulations; and

(b) application of pesticides; and

(c) other practices as the Minister may deem acceptable from time to time.

Registration

13. No person shall construct, install or operate a storage tank system without first completing and filing, in the prescribed manner, a form as set out in Schedule B.

14. No person shall operate an existing storage tank system without registering the storage tank system with the department on a form provided by the department within 90 days from the date of filing of this regulation.

15. No person shall alter an existing storage tank system without registering the plans of alteration in writing with the department.

Testing

16. (1) No person shall set into operation a new storage tank system without first having the tests prescribed in section 2 of Schedule A conducted.

16. (2) No person shall set into operation a storage tank system on which alterations have been done without first having the tests prescribed in section 2 of Schedule A conducted.

17. (1) The operator of an underground storage tank system, other than a storage tank system connected to a heating appliance or a waste oil collection tank, shall

(a) ensure that the tank or tanks are gauged or dipped, including a water dip, each day of operation;

(b) reconcile gauge or dip readings with meter readings at least daily;

(c) maintain a record of gauge, dip and water dip readings and reconciliations on a form approved by the department;

(d) retain the records described in clause (c) for at least two years and have the records available for inspection by an Environment Officer;

(e) inform the department forthwith of any losses above normal as indicated by four consecutive reconciliations;

(f) in critical and sensitive areas, submit a copy of all reconciliations records every three months to the department;

(g) upon the request of the department, submit reconciliations records for a period specified by the department.

17. (2) The operator of an above ground storage tank system, other than a storage tank system connected to a heating appliance or waste oil collection tank, shall

(a) ensure that the tank or tanks are gauged or dipped, including a water dip, at least weekly;

(b) reconcile gauge or dip readings with receipt and withdrawal records at least weekly;

(c) maintain a record of gauge, dip and water dip readings and reconciliations on a form approved by the department;

(d) retain the records described in clause (c) for at least two years and have these records available for inspection by an Environment Officer;

(e) inform the department forthwith of any losses above normal as indicated by two consecutive reconciliations;

(f) in critical and sensitive areas, submit a copy of all reconciliations records every three months to the department;

(g) upon the request of the department, submit reconciliations records for a period specified by the department.

17. (3) The operator of a storage tank system which is partly or entirely at or below grade, other than a storage tank connected to a heating appliance or a waste oil collection tank, shall

(a) determine cumulative apparent losses from the tank or tanks on a semi-annual basis, with readings taken on January 15 and July 15 or within seven days from these dates;

(b) inform the department forthwith if the cumulative loss from the storage tank system exceeds ½ of 1% of throughput for the period under consideration.

17. (4) Notwithstanding section 17, the Minister may, subject to such terms and conditions as he deems appropriate, vary the requirements of section 17 provided the operator files a written proposal with the department outlining the methods and procedures to be used by the operator to conform with the intent and purpose of section 17.

18. In accordance with sections 5, 6, 16 and 21, the operator of a storage tank system shall, within 30 days of the completion of testing, submit the test results in the prescribed manner on a form as set out in Schedule C.

19. The owner or operator of a storage tank system shall maintain records of all tests prescribed in Schedule A.

20. In the event of a spill or leak from a vehicle, pipeline or storage tank system, the operator of the vehicle, pipeline or storage tank system shall immediately

(a) notify an Environment Officer; and

(b) take such steps as are necessary to abate the discharge, clear the area affected and restore the environment to the satisfaction of the Environment Officer.

21. Upon request of the department, the operator of a storage tank system shall have the tests prescribed in section 3 of Schedule A conducted within 30 days or such other period of time as may be prescribed by the department.

22. When a leak is demonstrated in accordance with sections 5, 6 and 21, the operator of a storage tank system shall promptly

(a) empty that part of the system that is leaking; and

(b) affix an appropriate visible closure notice on the leaking system; and

(c) make such repairs as are necessary; and

(i) where the leak is from a tank, that tank shall be upgraded to meet section 1 of Schedule A;

(ii) where the leak was caused by corrosion, all related storage tank systems which do not meet the requirements of section 1 of Schedule A shall be upgraded to meet the minimum requirements prescribed in section 4 of Schedule A;

23. Where an underground storage tank system has been abandoned, the owner or operator of the storage tank system shall, within 30 days, empty the system of all product; and

(a) remove the piping from the ground, or purge the piping of flammable vapours and products and permanently seal the ends of the piping by capping; and

(i) remove the tank from the ground and remove such contaminated soil and gasoline or associated product if the soil around and under the tank is contaminated with gasoline or associated product; or

(ii) where a test conducted in accordance with section 3 of Schedule A has shown that the tank does not leak, purge the tank of flammable vapours and products and fill the tank with inert material; and

(b) clean the area affected and restore the environment to the satisfaction of the Environment Officer.

24. The Minister may, upon receipt of a written request from an owner, extend the period of time, with such terms and conditions as he deems appropriate, for a storage tank system to be in disuse without it being deemed abandoned.

25. (1) A welded above ground storage tank may be relocated for similar use if

(a) it is tested after installation but prior to use in accordance with section 2(c) of Schedule A and found to be sound; and

(b) it is diked in accordance with section 1(b) of Schedule A.

25. (2) Riveted above ground storage tanks shall not be relocated for use.

26. Manitoba Regulations 148/76, 42/77 and 246/77 are repealed.

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SCHEDULE A

CONSTRUCTION AND INSTALLATION STANDARDS

1 (a) Underground storage tanks shall be constructed, shop tested, installed and maintained in accordance with the Underwriters' Laboratories of Canada S603.1 latest edition or S603 latest edition with impressed current cathodic protection in the case of steel tanks.

Fiberglass underground storage tanks shall be constructed, shop tested and installed in accordance with Underwriters' Laboratories of Canada S615, latest edition.

1 (b) An impressed current cathodic protection system shall consist of a number of anodes connected to an external direct current power source, installed in such a manner that the static potential between the storage tank system and a saturated copper/copper sulfate half cell in contact with the soil shall read negative 850 millivolts or more negative.

The system shall be designed and installed employing sound engineering methods and taking into consideration factors such as the configuration of multiple tank systems, soil resistivity and existing structures in the immediate area.

1 (c) Shop fabricated overhead and above ground storage tanks (vertical and horizontal) shall be constructed and shop tested in accordance with Underwriters' Laboratories of Canada S601 latest edition and shall bear a U.L.C. label.

1 (d) Field erected above ground tanks shall be constructed in accordance with American Petroleum Institute Standard 650, latest edition.

1 (e) Above ground and overhead tanks shall be surrounded by a dike and the diked area shall be so designed, constructed and maintained to retain not less than 110% of the capacity of the tank or 110% of the capacity of the largest tank where more than one tank is enclosed in the diked area and to prevent infiltration of gasoline and associated product into the subsurface.

TESTING OF NEW SYSTEMS

2 (a) All piping systems shall be pressure tested with air, water or product, to at least 344.74 kPa (50 psig) or one and one-half times the maximum operating pressure, whichever is greater.

When piping systems are pressure tested

(i) with air, the lines shall be soaped and shall retain the pressure for a minimum period of two hours after the source of pressure has been removed; or

(ii) with liquid, the lines shall retain the pressure for a minimum of six hours after the source of pressure has been removed; and

(iii) the pressure shall be measured by an instrument calibrated in increments not greater than 3.45 kPa.

2 (b) Underground storage tanks shall be tested prior to operating (after backfilling) the storage tank system utilizing the Kent-Moore Tester System or other approved system. A test is not required prior to conducting pump or meter tests. Should the surface be paved following the setting into operation of the storage tank system, a further test is required.

2 (c) Above ground vertical storage tanks shall be tested immediately after first filling with product, in the following manner:

The tank shall be dipped every 12 hours for two consecutive days. Temperature readings at the top, bottom and middle of the tank shall be taken and a mean temperature of product determined. Corrections for expansion and/or contraction of product shall be applied to the calculations. Any variations from the original liquid levels other than those accounted for by the expansion or contraction will indicate leakage.

2 (d) Overhead horizontal tanks shall be visually inspected for leaks.

TESTING OF EXISTING SYSTEMS

3 (a) Underground storage tank systems with a suction pump shall be tested with the Kent-Moore Tester System or other approved system.

3 (b) Underground storage tank systems with a submersible pump will be tested as follows:

(i) the tank shall be tested with a Kent-Moore Tester System or other approved system;

(ii) all piping associated with the system shall be tested as in Section 2 (a) above.

3 (c) Above ground vertical tanks shall be tested in accordance with Section 2 (c) above.

3 (d) Overhead horizontal tanks shall be visually inspected for leaks.

UPGRADING OF EXISTING STORAGE TANK SYSTEMS

4 (a) When a test shows an underground storage tank system to be sound, it may be upgraded with the addition of:

(i) impressed current cathodic protection; or

(ii) installation of an approved internal non-corrosive tank lining.

4 (b) A dike shall be constructed around above ground storage tanks and the diked area shall be so designed, constructed and maintained to retain not less than 110% of the capacity of the tank or 110% of the capacity of the largest tank where more than one tank is enclosed in the diked area, and to prevent infiltration of gasoline and associated product into the subsurface.

SCHEDULE B

Registration Form

New Storage Tank System Installation

Business Name: _____

Business Address: _____

_____

Owner: _____

Operator: _____

Installer: _____

Please check one of the following:

– New Installation, no existing tankage at this location ☐

– New Installation, all existing tankage to remain ☐

– Tank Replacement, some or all existing tanks/piping to be removed ☐

Provide information as outlined below:

Tank No.							
Tank Type above ground/ underground/steel/ fiberglass							
Tank Capacity							
Tank Manufacturer							

Registration Form
New Storage Tank Installation

Tank Construction Specification – check appropriate box:

ULC S603	☐	ULC S603.1	☐
ULC S615	☐	ULC S601	☐
API 650	☐	Variance approved	☐

Projected Installation Date: _____

Attach a drawing of the proposed installation, showing tank and piping location, adjacent roads and buildings and corrosion protection equipment or dikes, where applicable.

I hereby certify that the information provided by me on this registration form is complete and accurate.

Signed: _____

Date: _____

Forward the completed form, with drawing, to:

Environmental Control Branch
Box 7, Building 2
139 Tuxedo Avenue
Winnipeg, Manitoba
R3N 0H6

SCHEDULE C

TEST RESULTS

Station Name: _____

Address: _____

Test Performed By: _____

Date: _____

HYDROSTATIC TEST

Time	P.S.I.G.	Gallons Injected	Temp. °F	Time	P.S.I.G.	Gallons Injected	Temp. °F

48 HOUR DIP TEST

Time	Dip Reading	Gallons	Change	Temp.

PRESSURE TEST

Tested With

☐ Liquid

☐ Air

Initial Pressure _____

Duration of Test _____

Final Pressure _____

APPENDIX B

MANITOBA ENVIRONMENT

INVENTORY RECONCILIATION FORMS

Daily Inventory Balance Records

Instructions

— Inventory balance records are required for all underground petroleum tanks, with the exception of waste oil tanks and tanks connected to heating appliances. Records must be completed for each operating day. An "operating day" is defined as any day that product is put into or removed from the storage tank.

— You are not required to use these record forms if you are using another form which has been approved by the Manitoba Department of Environment.

— One Daily Inventory Balance Sheet is required each month for each product you handle. If you have two completely separate tank/pump systems for the same product, a separate sheet should be used for each system.

— Inventory balance records must be kept on file for two years. The record books must be kept available for inspection by an Environment Officer.

— You are required to notify the Department of Environment immediately if any of the following conditions are noted:

- — Daily variation shows a shortage on seven consecutive operating days;
- — Monthly variation shows a shortage greater than 1.5% of total sales that month, or tank capacity, whichever is greater;
- — Water dip exceeds 5 cm. (Water dips must be done at least weekly);
- — Any unusual shortages or changes in the patterns of variations;
- — **To place a report to the Department of Environment, call 945-7100 in Winnipeg, Manitoba.**

The record form should be completed as follows:

1) At the end of each operating day, record the meter readings (litres, not dollars), and the tank dip readings on the Daily Readings sheet.

2) From these readings, calculate your METER SALES and PHYSICAL INVENTORY. Enter these readings in Columns 3 and 5, respectively, on the Daily Inventory Balance Record sheet facing the readings page.

3) The previous day's physical inventory should be entered in Column 1 as the OPENING PHYSICAL INVENTORY.

4) Enter the volume of any product deliveries to the tanks in Column 2.

5) To calculate the figure in Column 4, take the figure in Column 1 and add Column 2. Then subtract the sales figure in Column 3. This will determine what your INVENTORY SHOULD BE.

6) Determine the difference between Column 4 and Column 5. This is your VARIATION TODAY (Column 6). If the figure in Column 5 is less than the figure in Column 4 then the difference is a shortage and should be recorded with a minus sign in front of it. Similarly, an overage exists if Column 5 is greater than Column 4. This should be written with a plus sign in front of the figure.

7) To calculate the VARIATION THIS MONTH, (Column 7) take the previous day's figure in column 7 and add or subtract the variation today. A plus or minus sign should be used in Column 7. The Variation This Month should not be carried forward to the next month.

8) At the end of the month, total Meter Sales and the final Variation This Month should be entered on the monthly summary sheet at the front of the record book.

Monthly Summary

	Product _____ Storage Capacity _____		Product _____ Storage Capacity _____		Product _____ Storage Capacity _____	
Month	Total Sales	Variation for Month	Total Sales	Variation for Month	Total Sales	Variation for Month

Daily Readings

Product _____

Month _____ Year _____

DAY	PUMP 1		PUMP 2		PUMP 3		PUMP 4		TOTAL METER SALES	TANK 1			TANK 2			TOTAL PHYSICAL INVENTORY
	Reading	Sales	Reading	Sales	Reading	Sales	Reading	Sales		Dip cm	Inventory litres	Water Dip cm	Dip cm	Inventory litres	Water Dip cm	
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
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27																
28																
29																
30																
31																

Daily Inventory Balance Record

Product _____

Month _____ Year _____

DAY	1 Opening Physical Inventory	+	2 Deliveries	—	3 Meter Sales	=	4 Inventory Should Be	5 Physical Inventory	6 Variation Today	7 Variation This Month
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
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30										
31										
TOTALS										

APPENDIX C

PETROLEUM PRODUCT STORAGE AND HANDLING

INVENTORY FORM

PETROLEUM PRODUCT STORAGE AND HANDLING
INVENTORY FORM

I GENERAL INFORMATION DATE _____

NAME OF FACILITY _____

LOCATION _____

ADDRESS _____ POSTAL CODE _____

OWNER _____ TELEPHONE _____

OPERATOR _____ TELEPHONE _____

OPERATOR'S CONTACT _____ TELEPHONE _____

II ABOVE-GROUND TANK SYSTEMS

PURPOSE OF ABOVE-GROUND TANK SYSTEM _____

_____

_____

_____

_____

ARE TANKS USED REGULARLY OR INTERMITTENTLY _____

_____

_____

FUEL SUPPLIER _____

_____

DELIVERY FREQUENCY AND METHOD _____

_____

ARE FUEL DELIVERIES/TRANSFERS SUPERVISED _____

WHAT INVENTORY RECORDS ARE KEPT AND AT WHAT FREQUENCY _____

_____

ARE RECORDS SATISFACTORY _____

COMMENTS _____

_____

II ABOVE-GROUND TANKS (cont'd)

TANK NO.				
PRODUCT				
TANK CONSTRUCTION				
CAPACITY				
VERTICAL OR HORIZONTAL				
TYPE OF BASE OR SUPPORT				
DYKE HEIGHT & MAT'L				
DYKE CONDITION				
VALVE CONDITION				
VALVE LOCKED				
TANK CONDITION				
TANK CONNECTED TO:				
YEAR INSTALLED				
INSTALLER				
DEFICIENCIES				

II **ABOVE-GROUND TANKS** (cont'd)

DIAGRAM OF TANK SYSTEM

- PLEASE INDICATE:
  1) TANK NUMBER
  2) LOCATIONS OF AND DISTANCE TO BLDGS., WELLS, WATER BODIES
  3) LOCATION OF DISTRIBUTION LINES (SOLID LINE = A/GROUND, DOTTED = U/GROUND)
  4) DYKE LOCATIONS
  5) VALVE LOCATIONS (⊗= NORMALLY OPEN, ⊠ = NORMALLY CLOSED)
  6) PUMP LOCATIONS
  7) COMPASS POINTS

III UNDERGROUND TANKS

PURPOSE OF UNDERGROUND TANK SYSTEM _____

_____

_____

_____

_____

ARE TANKS USED REGULARLY OR INTERMITTENTLY _____

_____

_____

FUEL SUPPLIER _____

_____

DELIVERY FREQUENCY AND METHOD _____

_____

ARE FUEL DELIVERIES/TRANSFERS SUPERVISED _____

WHAT INVENTORY RECORDS ARE KEPT AND AT WHAT FREQUENCY _____

_____

ARE RECORDS SATISFACTORY _____

HOW ARE TANK MEASUREMENTS MADE _____

_____

_____

ARE WATER DIPS DONE AND HOW OFTEN _____

_____

_____

ARE INVENTORY RECORDS MAINTAINED ON-SITE AND FOR HOW LONG _____

_____

_____

SOIL TYPE IN THE AREA _____

_____

COMMENTS _____

_____

_____

III UNDERGROUND TANKS (cont'd)

TANK NO.				
PRODUCT				
TANK CONSTRUCTION				
CAPACITY				
TANK PROTECTION (COATED, CATHODIC PROTECTION, ETC.)				
YEAR INSTALLED				
INSTALLER				
BACK-FILL MAT'L				
TANK TESTING				
- TYPE OF TEST				
- YEAR				
- RESULTS				
- TESTED BY:				
DISTANCE TO NEAREST				
- WATER BODY				
- WELL				

III UNDERGROUND TANKS (cont'd)

DIAGRAM OF TANK SYSTEM

- PLEASE INDICATE
  1) TANK NUMBER
  2) LOCATIONS OF AND DISTANCES TO BLDGS., WELLS, WATER BODIES
  3) LOCATIONS OF DISTRIBUTION LINES
  4) VENT PIPE LOCATIONS
  5) PUMP LOCATIONS
  6) COMPASS POINTS